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Pesticide Fact Sheet Number 111.1: Calcium Arsenate
(Tolerance Revocation)

(U.S.) Environmental Protection Agency, Washington, DC

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Pesticide Fact Sheet

Name of Chemical: Calcium Arsenate
Reason for Issuance: Tolerance Revocation
Date Issued: April 1991
Fact Sheet Number: 111.1

I. DESCRIPTION OF CHEMICAL

COMMON NAME: Calcium arsenate

CHEMICAL NAME: Calcium Orthoarsenate - $\text{Ca}_3(\text{AsO}_4)_2$

TRADE NAMES: Pencal®, Security®

EPA SHAUGHNESSY CODE: 013501

CHEMICAL ABSTRACTS SERVICE (CAS) NUMBER: 7778-44-1

PESTICIDE TYPE: Crop herbicide, insecticide and
molluscicide

PESTICIDE FAMILY: Inorganic arsenicals

U.S. AND FOREIGN PRODUCERS: Woolfolk Chemical Works, Inc.
Commercial Chemical Co.

II. USE PATTERNS AND FORMULATIONS

Calcium arsenate was registered as a foliar insecticide on various small fruits and berries, and certain vegetable crops. EPA cancelled the registration due to acute risks to the general population and cancer risks to workers in June of 1988 with no provisions for use of existing stocks after the cancellation date. It was applied at a rate of 4.5 lb. active ingredient/acre. As a molluscicide, calcium arsenate bait was composed of 80% bran, 10% molasses and 10% calcium arsenate.

III. SCIENTIFIC FINDINGS

- CHEMICAL CHARACTERISTICS

Calcium arsenate is a pentavalent form of inorganic arsenic. It normally exists as white crystals with no discernable odor. Calcium arsenate contains 38% arsenic and is very slightly soluble in cold water and soluble in dilute acids. The melting point is 1045°C, the specific gravity is 3.62 and the molecular weight is 398.08.

- TOXICOLOGICAL CHARACTERISTICS

Inorganic arsenical compounds have been classified as Group A, or known human carcinogens.

Inorganic arsenicals have been assayed for mutagenic activity in a variety of test systems ranging from bacterial cells to peripheral lymphocytes from humans exposed to arsenic. The weight of evidence indicates inorganic arsenical compounds are mutagenic.

Evidence exists there is developmental and fetotoxic potential based on intravenous and intraperitoneal routes of exposure; however, evidence by the oral route is insufficient to confirm calcium arsenate's developmental and fetotoxic effects.

Inorganic arsenicals are known to be acutely toxic. The symptoms which follow oral exposure include severe gastrointestinal damage resulting in vomiting and diarrhea, and general vascular collapse leading to shock, coma and death. Muscular cramps, facial edema and cardiovascular reactions are also known to occur following oral exposure to arsenic.

- ENVIRONMENTAL CHARACTERISTICS

Studies to demonstrate calcium arsenate's fate must take into account the fact that inorganic arsenicals are natural constituents of the soil, and that forms of inorganic arsenicals may change depending on environmental conditions. Based on limited data, calcium arsenate is not predicted to leach significantly, as it becomes fixed in insoluble compounds and is only minimally available for transport.

- ECOLOGICAL CHARACTERISTICS

Calcium arsenate is moderately toxic to birds, slightly toxic to fish and moderately toxic to aquatic invertebrate species.

IV. BACKGROUND

On October 18, 1978, EPA issued a Notice of Rebuttable Presumption Against Registration (RPAR)--now called Special Review--of pesticide products containing inorganic arsenic (as well as creosote, coal tar, coal tar neutral oils, and pentachlorophenol).

On January 2, 1987, EPA proposed to cancel most registrations for inorganic arsenicals, including the food uses of calcium arsenate, based on acute toxicity from accidental ingestion and carcinogenic risks posed to workers. The final determination to cancel these registrations was issued June 30,

1988 (53 FR 24787). In that Notice, the sale, distribution and use of food use products containing calcium arsenate were prohibited after August 1, 1988. A proposed revocation for all tolerances of calcium arsenate was published August 15, 1990.

V. TOLERANCE REVOCATION

EPA has revoked all tolerances for calcium arsenate (formerly found at 40 CFR 180.192).

VI. REGULATORY POSITION AND RATIONALE

Calcium arsenate was registered for food uses as an insecticide on various field and orchard crops. The cancellation of these registrations, based on acute toxicity and carcinogenic risks to workers, was announced in a June 30, 1988 Federal Register Notice. In that Notice, the sale, distribution and use of calcium arsenate, including that granted in any previous existing stocks provision, was prohibited after August 1, 1988. It was noted in that Federal Register Notice that most registrations had been either suspended or voluntarily cancelled before the 1988 cancellation Notice. It is believed all treated commodities have passed through channels of trade, so that seizure of legally treated goods is unlikely. No economic impact is expected as a result of cancellation of these uses since it is estimated that there has been no use for several years.

VII. CONTACT PERSON

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